Perkins Brailler Cleaning Guide

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Introduction

Welcome to the Perkins Brailler Cleaning Guide, developed by Perkins School for the Blind.

Please note, if your Brailler does not operate up to standards after you complete this guide, contact a local repair specialists located on our website.

Setting Up

To perform this do-it-yourself cleaning, you will need:

- ☐ One Screwdriver, #1 Phillips, 3" Shank Length
- ☐ One Screwdriver, #2 Phillips, 8" Shank Length
- ☐ One Paint Brush, Chip, 1” Brush Head
- ☐ One Wire Brush, 1” Brush Head
- ☐ Two Acid Brushes, ⅜” Brush Head
- ☐ One Lint-Free Cloth
- ☐ One Small Cup
- ☐ One Cleaning Pan, 17” L X 10” W X 6” H
- ☐ One Compartmentalized Tray
- ☐ One 1.75 oz. Tube of Lubriplate Grease
- ☐ One 2 oz. Bottle of Brailler Oil
- ☐ Cleaning Solvent, (neutral, Petroleum-based mineral spirits, or equal)

If you do not have all of these items, please refer to our website or our list of alternative cleaning materials.

Part One: Disassemble the Brailler

1.0 Prepare to Dismantle

1.0.1 For this part, you will need the #1 screwdriver, the # 2 screwdriver with an 8 inch shank, and a compartmentalized tray.

1.0.2 To set up your tray for reassembling, use one compartment of your tray for each disassembling step that requires removal of small pieces.

1.1 Step 1: Remove the bottom cover.

1.1.1 Turn the machine on its back.

1.1.2 Use the #1 screwdriver to remove all 11 bottom screws, placing each screw in the first compartment of your tray.

1.1.3 Now lift off the bottom cover, place it aside, and turn the machine back to its normal upright position.

1.2 Step 2: Remove the paper release knobs.

1.2.1 Some machines have two paper release knobs above each of the paper feed knobs. These would be screwed into the paper release levers, located on the top of your machine, in the far left and right back corners.

1.2.2 To remove each knob, use the #1 screwdriver to remove the screw from the knob.

1.2.3 Replace the screw into the removed knob, and place it in the second compartment of your tray.

1.2.4 Repeat the same activity for the remaining knob and screw.

1.3 Step 3: Remove the top plate.

1.3.1 With the brailler facing you, use the #1 screwdriver to remove the two top plate screws closest to the back of the brailler.

1.3.2 Place the screws in the third tray compartment.

1.3.3 Use the #2 screwdriver to remove the remaining four screws, and place them in the fourth tray compartment.

1.3.4 Now, with all six screws removed, lift off the handle and top plate assembly.

1.4 Step 4: Lift out the left paper stop and guide assembly.

1.4.1 Turn the machine around so that it is facing you.

1.4.2 Lift out the left paper stop and guide assembly, the small, round, and rough knob located on the back top right part of the machine. Again, place these pieces into the next tray compartment.

1.5 Step 5: Remove the back plate and margin.

1.5.1 With the back still facing you, use the #2 screwdriver to remove the four attaching screws on the back plate.

1.5.2 Place screws in the next tray compartment.

1.5.3 Remove the back plate, which, as you'll notice, has the margin assembly attached to it.

1.5.4 Now turn the machine around so that the keys are facing you.

1.6 Step 6: Remove the carriage lever assembly.

1.6.1 First, locate the attaching screw directly behind the carriage lever assembly, which is the scoop like lever above the keys.

1.6.2 Using your #1 screwdriver, remove the screw and any washers that may be present.

1.6.3 Slide the lever assembly towards you and place it in the same tray compartment as the carriage lever assembly screw and washer you just removed.

1.7 Step 7: Remove the apron.

1.7.1 The apron is the long and bow-shaped piece located at the bottom front of the brailler. It is attached to the end plates with two screws.

1.7.2 To remove the apron, invert the machine (bottom up, back toward you).

1.7.3 Locate the two attaching screws: one in the upper left corner of the end plate, and the other in the upper right corner of the end plate.

1.7.4 Using the #2 screwdriver, remove the screw in the upper left corner and place it in the next tray compartment.

1.7.5 Next, loosen, but do not remove, the upper right back screw and the flat washer from the apron.

1.7.6 Now remove the apron by slightly pulling it to the left and lifting it up.

1.8 Step 8: Remove the front plate.

1.8.1 After you return the brailler to its upright position with the keys facing you, use the #1 screwdriver to remove the remaining two screws on the front plate.

1.8.2 The screws are on the far right and left of the brailler, located just above the back spacer and the line spacer.

1.8.3 After placing the screws in the next tray compartment, lift off the front plate.

1.9 Step 9: Remove visible objects.

1.9.1 Now that the Perkins Brailler is completely disassembled, use this time to visually inspect the machine for any foreign objects or paper bits that may be present. You may be surprised what you find! Remove these objects as necessary.

Now you are ready for dusting.

Part Two: Dusting the Perkins Brailler

2.0 Prepare to Dust:

2.0.1 The only material you will need for dusting is the one inch chip paint brush.

2.1 Step 1: Dust the front of the Brailler.

2.1.1 Brush the entire surface area on the front of the machine from top to bottom, including all the crevices, key levers, and chain assembly links.

2.1.2 Move the carriage assembly as needed so that it is not in your way.

2.2 Step 2: Dust the back of the Brailler.

2.2.1 Turn the brailler so that the back is facing you.

2.2.2 Dust off the entire surface area on the back of the machine from top to bottom, including the constant force beams, the pressure roller, the feed roller, and the cam rods.

2.2.3 While dusting the pressure roller, be careful not to damage the o-rings, which are the circular rings evenly spaced across the pressure roller.

2.2.4 Also, pay particular attention to the cam rods, which are the six flat rods that run the entire length of the brailler, located under the embossing head at the bottom of the exposed machine. This is an area where dust can heavily accumulate.

2.3 Step 3: Dust the bottom of the Brailler.

2.3.1 Turn the brailler so that the bottom is facing upwards.

2.3.2 Thoroughly brush all exposed parts.

You're now ready to clean.

Part Three: Cleaning the Perkins Brailler

3.0 Prepare to Clean the Brailler.

3.0.1 For this part, you will need your cleaning pan, cleaning solvent, chip paint brush, wire brush, two acid brushes, and a lint-free cloth.

3.0.2 Pour enough of the cleaning solvent so that the bottom of the pan is filled with about ½ inch of cleaning solvent.

3.0.3 Set the brailler upright in the solvent with the back towards you.

3.0.4 While cleaning the brailler, keep three things in mind:

3.0.5 Work your way from the top of the machine to the bottom of the machine.

3.0.6 Continually dip your brushes into the solvent as you clean.

3.0.7 Move the carriage assembly back and forth so that it is out of your way.

3.1 Step 1: Cleaning the back of the Brailler.

3.1.1 With your chip paint brush, thoroughly clean the entire surface area of the back portion of the brailler.

3.1.2 Be sure to clean the back of the constant force beam, which is the long beam that spans the length of the machine and the pressure roller, which is the grooved circular roller spanning the length of the machine.

3.1.3 After cleaning from top to bottom, move the paper release levers away from you to gain access to the paper check assembly, the round knob that protrudes out about 1 inch from the top right side of the machine. This part often collects dust and oil.

3.1.4 Pull the paper release levers back towards you, and turn the brailler around to begin cleaning the front.

3.2 Step 2: Cleaning the front of the Brailler.

3.2.1 Using your chip paint brush, begin scrubbing the machine.

3.2.2 Be sure to clean the front of the constant force beam and the drum assembly at top of the machine.

3.2.3 Then, pull the paper check assembly, the round knob protruding out of the back left side of the machine to the right of the paper release lever, towards you so that the drum gear on the right side of the drum assembly is exposed.

3.2.4 While pulling the paper check assembly towards you, thoroughly clean the drum gear.

3.2.5 Next, release the paper check assembly, and begin washing the carriage rod and drive chain assembly.

3.2.6 The carriage rod is the shiny silver rod that the embosser rides on and spans the length of the brailler.

3.2.7 The Next, clean the chain-drive assembly by brushing the chain and the chain gear, located on the right side of the chain assembly, with the cleaning solvent. Move the carriage assembly to the far right and then to the far left to gain access the entire chain during the cleaning process.

3.3 Step 3: Cleaning the keys.

3.3.1 Pull the brailler out of the solution and set on the side of the pan.

3.3.2 Using the chip paint brush, wash all the key slots allowing the solvent to remove dirty gunk.

3.3.3 Dip brush in solvent each time, washing both the left and the right side of the metal keys.

3.4 Step 4: Cleaning the bottom of the brailler.

3.4.1 Now turn the machine upside down, so that it is resting on the corner of your pan with the bottom facing up towards you. Do not submerge the top of the brailler in the solvent, as too much liquid on the feed roller can damage the rubber.

3.4.2 Now brush the bottom and base of the brailler with solvent, and make sure to get in deep on both sides of the brailler with your brush.

3.5 Step 5: Cleaning the Pawls on the Escapement Mechanism.

3.5.1 Check to make sure the carriage assembly is over to the far left before turning the machine over.

3.5.2 With your left hand, reach around and hold the carriage over to the left so that it opens the pawl underneath of the machine on the left hand side.

3.5.3 Then, grab your ⅜ inch acid brush and begin brushing solvent over the pawl that opens up when the carriage is held to the left. This pawl needs to be thoroughly cleaned, making sure there is no oil on it. If the pawl becomes sticky with dirt or grease, the carriage will not move or operate properly.

3.5.4 Let's see this from another angle.

3.6 Step 6: Cleaning the line spacer pawl.

3.6.1 Next, turn the brailler on it's side with the exposed back towards you, and place it on the corner of the cleaning bin.

3.6.2 Use your ⅜ inch acid brush to clean the line spacer pawl, which is the mechanism that moves on the left side of the brailler when you depress the line spacer.

3.7 Step 7: Clean the backspace pawl.

3.7.1 Place the brailler on the corner of your cleaning pan so that the bottom of the brailler is facing you.

3.7.2 Use your 3//8 inch acid brush to clean the backspace pawl, which is the gear that moves when you depress the backspace lever on the right underside of the machine.

3.7.3 Step 8: Clean the Grooved Rollers.

3.7.4 Next, locate the grooved rollers: the wheel like metal piece far left and far right at each end of the saw like cell space rack. These levers are engaged when you depress the space bar.

3.7.5 With your brailler resting on the corner of the cleaning pan, lift the lever on the far right side that rests against the right end plate to access the grooved roller behind the backspace lever.

3.7.6 Now using your 3/8 inch brush, clean thoroughly until the pivot pin spins freely

3.7.7 Repeat on the other side.

3.8 Step 8: Cleaning the Cam Rods.

3.8.1 The cam rods are the six flat rods that span the entire length of the brailler, located under the embossing head at the bottom of the exposed machine. To clean these, we will set the brailler on the corner of the pan.

3.8.2 Use your wire brush to thoroughly scrub the cam rods, moving the carriage assembly as needed.

3.8.3 Next, using your chip paint brush, thoroughly scrub the cam rods again, dipping the brush in the solvent once or twice in between strokes.

3.8.4 Be sure to clean the raised cams as well. To do so, lay your hand across all the keys on the front. While the keys are depressed, brush the solvent across the raised cams.

3.9 Step 9: Check for fallen out parts. [29:09]

3.9.1 Make sure that you replace any pieces that may have fallen out while cleaning.

3.10 Step 10: Set Brailler aside to dry.

3.10.1 Turn the clean brailler right side up and set it atop the pan's edges.

3.10.2 Allow the brailler to air-dry for 5 to 10 minutes

Part Four: Drying the Perkins Brailler

4.0 Prepare to Dry:

4.0.1 For this part, you will need your lint-free cloth and the cleaning solvent.

4.1 Step 1: Wipe down machine.

4.1.1 Once air-dried, remove the brailler from the pan and set on a flat surface

4.1.2 Splash a small amount of cleaning solvent on the cloth, and begin wiping down the entire machine, from top to bottom, to remove any remaining excess solvent.

4.1.3 Wipe off the line spacer, the keys and the back spacer.

4.1.4 Wipe off the chain, moving the carriage as needed.

4.1.5 Wipe off the drum roller and the beam.

4.1.6 Turn the machine around and begin wiping the cam rods. For this part, be sure to depress the keys so that you can wipe inside the cam rods as well.

Part Five: Oil and Grease the Brailler

5.0 Prepare to Oil & Grease

5.0.1 For this part, you will need brailler oil, a small cup, a ⅜ inch acid brush, lubriplate grease, a lint-free cloth, and cleaning solvent.

5.0.2 Pour brailler oil, about one second's worth, into a cup and set aside.

5.0.3 Caution, do not over lubricate. Please closely follow the instructions as to the amount of lubricant and the location of lubricant required. Over lubrication will increase the likelihood of dust and debris to collect at a faster rate, although it will not damage or break the brailler.

5.1 Step 1: Oil the felt within the carriage head.

5.1.1 During this step, we will apply oil on an internal felt pad located inside the bottom of the carriage head. This is a part that is not visible, as it is inside of an enclosed metal cylinder like tube. We will oil it by letting oil drip down into the access point.

5.1.2 Turn the brailler so that it is resting on the left end plate and move the carriage to the far left.

5.1.3 Place one drop of oil on to the carriage rod and let the oil drip down into the carriage head. Watch as the oil meets the access point of the carriage.

5.1.4 Push keys down until the carriage is on the far right of the machine.

5.1.5 Turn the brailler onto the right end plate, and repeat this process.

5.2 Step 2: Distribute oil on the felt pad.

5.2.1 Replace the carriage knob.

5.2.2 Gradually slide the carriage back and forth several times.

5.2.3 After moving the carriage back and forth several times, you should see a small trace of oil on the carriage rod. If not, re-oil.

5.3 Step 3: Grease brailler key bearings.

5.3.1 Using the lubriplate grease, apply a very small amount of grease (less than a pea size) on top of each key bearing, for a total of six access points, one for each key. The key bearings are the nut like shaped object located just above the keys. When the keys are not depressed, the bearings are at the bottom of a one inch oval gap. When the keys depress, the bearing stays stationary, and then it is located at the top of the oval gap. Grease should be placed at the top of the bearings.

5.3.2 To access each bearing, depress the keys to the left or right of each key.

5.4 Step 4: Distribute brailler key grease.

5.4.1 Depress the keys ~80-90 times to work the grease in thoroughly.

5.5 Step 5: Grease pivot pins and grooved rollers.

5.5.1 Grease both grooved rollers, which again, are the wheel like metal pieces at each end of the saw-like cell space rack. Each pin and grooved roller only needs a very small amount of grease, no more than a pea size for each key.

5.6 Step 6: Distribute grooved roller grease.

5.6.1 Flip the Brallier back over to its upright position and exercise the line spacer 25 times, the back spacer 25 times, and the cells pacer 25 times to work in the grease.

5.7 Step 7: Oil the cam rods (38:19)

5.7.1 Dip your 3/8 inch acid brush into the cup of oil, tap off any excess, and then oil the cam rods.

5.7.2 Oil the six flat rods that span the entire length of the brailler, located under the embossing head at the bottom of the exposed machine.

5.7.3 Avoid over lubrication here, as the cam rods are a place that can collect dust.

5.8 Step 8: Clean the drum assembly and rubber roller.

5.8.1 Apply some cleaning solvent to a lint-free cloth.

5.8.2 Scrub the drum assembly and rubber roller while turning the knob to remove any oil or grease that may have gotten on the roller.

5.8.3 Move the carriage to the left and repeat the process of cleaning.

5.8.4 The brailler is now completely cleaned and lubricated and ready to be reassembled.

Part Six: Reassembling the Brailler

6.0 Prepare to Reassemble

6.0.1 For this part, you will need the #1 screwdriver, the # 2 screwdriver, and your filled compartmentalized tray.

6.0.2 Reassembling will require you to use your compartmentalized tray in reverse order from disassembly. Each step of assembling will require parts from one compartment in your tray.

6.1 Step 1: Check for loose screws.

6.1.1 Before reassembling, tighten any loose screws, such as the three on the left front side, the one on the left underneath the drum gear, the six screws holding in the keys, the screws on the right and left endplate, the screws holding in the knobs, and the four large screws in the back of the machine on the far left and ride side.

6.2 Step 2: Replace the front plate.

6.2.1 Install the front plate on by sliding it down over the keys.

6.2.2 Screw in the two screws on the far right and left of the brailler, located just above the back spacer and the line spacer.

6.2.3 Center front plate to be sure keys and spacebar are free and not rubbing on casting, then finish fastening screws.

6.3 Step 3: Replace the apron.

6.3.1 Invert the machine (bottom up, back toward you) and install the apron assembly by slotting the apron screw into the open hook on the ride side of the machine.

6.3.2 Be sure that the washer is between the head of the mounting screw and the end plate.

6.3.3 Then, with the #2 screwdriver, loosely fasten the remaining screw and washer on the other side of the apron.

6.3.4 Work back and forth between the two screws until each are securely fastened.

6.4 Step 4: Replace the carriage lever assembly.

6.4.1 Turn the brailler around so it is facing you again.

6.4.2 Slide the lever assembly into the carriage slot.

6.4.3 Using your #1 screwdriver, fasten the screw and washer to the carriage lever assembly.

6.4.4 Move the carriage to the left and turn the machine around so that the back is facing you.

6.5 Step 5: Replace the back plate and margin.

6.5.1 Move margin stops to opposite ends of the back plate.

6.5.2 Center the carriage.

6.5.3 Place back plate in position, being sure to keep the tail of the paper check spring under the top edge of the casting.

6.5.4 To move the paper check spring, you may need to use your screwdriver.

6.5.5 Using the #2 screwdriver, loosely install all four screws.

6.5.6 Then, depress all the keys with your left hand, and begin firmly tightening each screw, starting with the top left, then the bottom right, then the top right, then the bottom left.

6.6 Step 6: Place the left paper stop and guide assembly.

6.6.1 Turn the machine around so that it is facing you.

6.6.2 Lay the left paper stop and guide assembly, the small, round, and rough knob located on the back top right part of the machine, into the indented slot on the top right back of the machine, behind the paper check assembly.

6.7 Step 7: Replace the top plate.

6.7.1 With the brailler facing you, place the top plate onto the brailler, being sure not to knock out the left paper stop and guide assembly.

6.7.2 Use the #2 screwdriver to install the four screws on the front of the top plate.

6.7.3 Then, use the #1 screwdriver to install the remaining two screws in the back of the top plate.

6.8 Step 8: Replace the paper release knobs.

6.8.1 Place the small screw from the paper release knob into the paper release lever.

6.8.2 Holding the knob with one hand, install the screw with the other.

6.8.3 Repeat the same activity for the remaining knob and screw.

6.9 Step 9: Replace the bottom cover.

6.9.1 Turn the machine on its back.

6.9.2 Use the #1 screwdriver to reinstall the 11 bottom screws.